

REMARKS

I. General

This Amendment is Applicants' response to the Office Action dated January 16, 2002 ("Office Action"). The pending claims in the present application are claims 11-18, 21-28, and 31-46. The Examiner has rejected all of the pending claims under 35 U.S.C. §§ 102, 103, and/or 112. The Examiner has also objected to the specification, abstract, and drawings. In this Amendment, Applicants have traversed each of the Examiner's bases for rejecting the claims and objecting to the specification, Abstract, and drawings. As such, Applicants respectfully request that the application be passed to issue in due course.

In the numbered Section 4 of the Office Action, the Examiner indicated that the specification must be amended to reflect the current status of the application. To comply with this request, Applicants have amended the specification as indicated above. This amendment overcomes the Examiner's objection.

In numbered Section 5 of the Office Action, the Examiner states that the Abstract must be amended to be aligned with the claimed invention. Applicants have amended the Abstract in the Section "In the Abstract" above to overcome this objection. Accordingly, Applicants have overcome this objection.

The Examiner, at numbered Section 6, has requested that a supplemental oath or declaration be filed pursuant to 37 C.F.R. § 1.67. Applicants submit that this is not necessary given the claims have been amended to what the Examiner suggested which is fully supported by the specification as filed. (See Section II below). Accordingly, the objection is moot.

In numbered Section 7, the Examiner has objected to the drawings under 37 C.F.R. § 1.83(a). The Examiner has requested that the drawings be amended to show an anti-reflective coating and a light blocking layer. Applicants have added Figure 3 to show the embodiment of the present invention with an anti-reflective coating and Figure 4 to show the embodiment with a light blocking layer. This does not add new matter to the application. Applicants attach as Attachment 2, Figures 3 and 4 that show the two embodiments described in the specification.

In numbered Section 8 of the Office Action, the Examiner has objected to Figure 1 for not containing the designation “Prior Art.” Applicants have corrected that figure and attach it at Attachment 3.

Applicants have added additional information to the disclosure to describe Figures 3 and 4. This added information does not add new matter to the application.

II. The Section 112 Rejections Are Traversed

In the Office Action, the Examiner rejected all of the pending claims, claims 11-18, 21-28, and 31-46, under 35 U.S.C. §§ 112, first paragraph, for containing subject matter not described in the specification. The Examiner has suggested language to include in independent claims 11, 21, 31, and 39 to overcome this rejection. Applicants have followed the Examiner’s suggestion and amended these claims accordingly.

Given that Applicants have amended claims 11, 21, 31, and 39 as suggested by the Examiner, they have overcome the bases for rejecting these claims under 35 U.S.C. §112, first paragraph. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 12-18 depend from claim 11, claims 22-28 depend from claim 21, claims 32-38 depend from claim 31, and claims 40-46 depend from claim 39. Since each of these dependent claims add features to the independent claims from which they depend, each will traverse the rejection based on 35 U.S.C. § 112, first paragraph, for the same reason as their respective independent claims. Therefore, Applicants respectfully request that this rejection be withdrawn with respect to dependent claims 12-18, 22-28, 32-38, and 40-46.

III. Heat Leaching is Known in the Art

The Examiner has rejected claims 18, 28, 38, and 46 under 35 U.S.C. § 112, first paragraph. The substance of the rejection is that the Examiner contends that “leaching” with heat to remove impurities was not known at the time of the invention. Specifically, the Examiner stated the following with regard to leaching:

Referring to page 6, lines 22-24, and to claims 18, 28, 38, and 46, the specification does not disclose any of the particulars as to how to leach sodium constituents from a glass substrate. The plain meaning of the word, “leach” is “to remove soluble constituents...by the action of a

percolating liquid." As glass is vitreous, it is unknown how any liquid could percolate through a glass substrate so as to leach sodium....

Consequently, it is the position of the Examiner that the specification fails to teach how to leach sodium from the substrate without undue experimentation.

In the July 20, 2001, response, Applicants' brought to the Examiner's attention U.S. Patent Nos. 6,063,690 and 6,059,887. The '690 patent uses the term "leaching" to describe the method for the removing impurities using heat. The '887 patent describes the same process but does not use the specific word "leaching." This is the proof that the Examiner requested that showed the term "leaching" with heat, not percolating a liquid, was known in the art. However, the Examiner now contends that this is not sufficient because these patents were not in the public domain at the time of the invention.

Applicants attach as Attachment 4 a copy of U.S. Patent No. 5,444,001 which is titled "Method of Manufacturing a Semiconductor Device Readily Capable of Removing Contaminants from a Silicon Substrate." This patent issued August 22, 1995. At column 6, lines 49-57 it describes the use of heat to drive out contaminants. This is heat leaching consistent with the '690 and '877 patents. Accordingly, one skilled in the art would understand from the use of the term "leaching" as it is used in the present application would be heat leaching and not the use of a percolating liquid as the Examiner contends. Therefore, noting the foregoing, Applicants have traversed the Examiner's basis for rejecting claims 18, 28, 38, and 46 under 35 U.S.C. § 112, first paragraph, and respectfully request that it be withdrawn.

IV. The Present Invention is Novel and Nonobvious

In the Office Action, the Examiner has relied on U.S. Patent No. 5,534,744 ("the '744 patent) to reject certain claims of the application under 35 U.S.C. § 102 for anticipation and 35 U.S.C. § 103 for obviousness. Applicants have reviewed the '744 patent and submit that this reference does not anticipate or render obvious any of the claims of the present application. This will be shown in the remainder of this Section.

A. Claims 11, 13, 15, 17, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 are not Anticipated

The only reference that the Examiner has cited in rejecting the claims 11, 13, 15, 17, 21, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 is the '744 patent. Claim 11, 21, 31, and 39 are independent claims and the remainder are dependent claims. The examiner states the following in rejecting the claims"

...Leroux et al. [the '744 patent] disclose a cathode substrate including a substrate 2 (see FIG. 6), a cap layer (silica layer 4), an anti-reflective coating (see col. 5, lines 49, 50, underlays 52, and an array of emitter tips 12.

The basic structure that is shown in Figure 6 is described with respect to Figure 1 (which is in the prior art). The '744 patent states the following about the structure of Figure 1 and, therefore, Figure 6 with respect to what the Examiner contends teaches the present invention (column 1, lines 38-45):

An embodiment of the known electron source is diagrammatically shown in plan view in FIG. 1A and in sectional view in FIG. 1B, which is the section CC of FIG. IA.

This known source has a matrix structure and comprises an e.g. glass structure 2 and optionally on the latter a thin silica film. On the latter is formed a series of electrodes in the form of parallel conductive strips serving as cathode conductors and constituting the columns of the matrix. (Emphasis added)

The foregoing quotation makes plain that the silica layer 4 is not needed since it may be optionally provided. This means that the underlying substrate, glass structure 2, can appropriately have the cathode conductors placed on it without degradation in performance. If this were not the case, the silica layer 4 would have been mandatory.

In present invention, the cap layer is not optional, it is mandatory. The cap layer is needed to protect against the low quality substrate. In fact, the present application even permits the substrate to be formed from plastic because of the existence of the cap layer. There is no teaching or suggestion in the '744 patent that the substrate could be soda-lime glass that requires a cap as is taught by the present invention so that there would be proper performance of the structure. In fact, if the '744 patent is followed, the structure in the typical case provide for placing the cathode conductors on the soda-lime or plastic substrate. As would be known in the art, such a structure would not work properly.

Therefore, the '744 patent does not anticipate the claims 11, 13, 15, 17, 23, 25, 27, 31, 33, 35, 37, 39, 41, 43, and 45 of the present invention and this rejection should be withdrawn.

Claims 12-18 depend from claim 11, claims 22-28 depend from claim 21, claims 32-38 depend from claim 31, and claims 40-46 depend from claim 39. Each of the dependent claims that is not separately cited in the rejection traverses the Examiner's rejection for anticipation for the same reasons as set forth for the claims from which each depends. Accordingly, this rejection should be withdrawn.

Applicants have overcome the anticipation rejection under 35 U.S.C. § 102. Therefore, Applicants have traversed this rejection and respectfully request that it be withdrawn.

B. Claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 are Non-Obvious

In the Office Action, the Examiner rejected dependent claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 for obviousness under 35 U.S.C. § 103 based on the '744 patent. In rejecting these claims, the Examiner stated he following:

Referring to claims 12, 22, 32, and 40, Leroux et al. [the '744 patent] disclose a cathode substrate as recited in claims 11, 21, 31, and 39 including a substrate 2 made of glass. See col. 1, lines 41-45. Leroux et al. do not disclose a cathode substrate wherein the substrate 2 [is] made of soda-lime glass. The selection of known materials for a known purpose is generally considered to be within the skill in the art. It would have been obvious to use soda-lime glass, for the substrate 2, as disclosed by Leroux et al., because the selection of known materials for a known purpose is generally considered to be within the skill of the art.

Specifically, in rejecting claims 12, 22, 32, and 40, the Examiner's position is that it would be known in the art to select soda-lime glass or other inexpensive substrate, including plastic, for the structure that is shown in Figure 1 of the '744 patent is not supported by this patent. As discussed in the preceding Section (relating to the claims not being anticipated by the '744 patent), it was made clear that the structure in Figure 1 optionally uses silica layer 4. Therefore, the '744 does not anticipate any structure that does not employ layer 4 as a requirement and allows for the placement of the cathode conductor matrix directly on the substrate. As such, the '744 patent does not teach,

suggest, or contemplate structures that use inexpensive substrates, such as soda-lime glass or plastic. If the '744 patent recognized this, it would not have made the use of layer 4 optional but mandatory as in the present invention. Noting this, Applicants have traversed the obviousness rejection as it has been applied to claims 12, 22, 32, and 40.

The Examiner has rejected claims 14, 24, 34, and 42 for obviousness based on the '744 patent. These claims are directed to the thickness of the cap layer. The Examiner has considered the thickness to be within the skill in the art even though the '744 patent is silent about the thickness.

Applicants submit that claims 14, 24, 34, and 42 depend from claims for that are not rendered obvious by the '744 patent. The reasons for this are set forth in Section IV.A. and the first portion of this Section IV.B. above. These reasons are incorporated here by reference. Given this, Applicants have traversed the Examiner's basis for rejecting claims 14, 24, 34, and 42 for obviousness based on 35 U.S.C. § 103.

The Examiner has rejected claims 16, 26, 36, and 44 for the same reasons as claims 12, 22, 32, and 40. As such, Applicants apply the same bases for overcoming the obviousness rejection to these claims as it applied to overcoming the rejection to claims 12, 22, 32, and 40. Therefore, Applicants have traversed the grounds for rejecting claims 16, 26, 36, and 44.

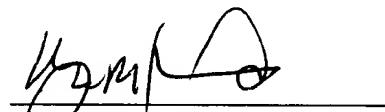
Applicants have traversed each of the grounds for rejecting dependent claims 12, 14, 16, 22, 24, 26, 32, 34, 36, 40, 42, and 46 for obviousness under 35 U.S.C. § 103 based on the '744 patent. Noting this Applicants respectfully request that this rejection be withdrawn.

V. Conclusion

Applicants have traversed each and every objection and rejection that the Examiner raised in the Office Action date January 16, 2002. As such, the specification, abstract, and claims are in condition for allowance. The present invention is new, non-obvious, and useful. Reconsideration and allowance of the claims are requested.

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Respectfully submitted,



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Attachment 1

11. (Twice Amended) An improved cathode substrate for a field emission display, comprising:

a substrate;
a cap layer disposed on said substrate;
an anti-reflective coating, with the anti-reflective coating being [associated] included with the cap layer; and
an array of emitter tips formed on said cap layer with the [associated] anti-reflective coating [on said substrate].

21. (Twice Amended) An improved cathode substrate for a field emission display formed by the steps of:

providing a substrate;
depositing a cap layer [disposed] with an anti-reflective coating on [said] the substrate;
[associating an anti-reflective coating with the cap layer;] and
forming an array of emitter tips on [said] the cap layer with the [associated] anti-reflective coating [therewith said substrate].

31. (Amended) An improved cathode substrate for a field emission display, comprising:

a substrate;
a cap layer [that has a light blocking layer associated therewith, the cap layer with the associated light blocking layer being] disposed on said substrate; [and]
a light blocking layer, with the light blocking layer being included with cap layer;
and
an array of emitter tips formed on said cap layer with the [associated] light blocking layer [the cap layer with the associated light blocking layer being disposed on said substrate].

39. (Amended) An improved cathode substrate for a field emission display formed by the steps of:

providing a substrate;

depositing a cap layer with [an associated] a light blocking layer on [said] the substrate; and

forming an array of emitter tips on [said] the cap layer with the [associated] light blocking layer [on said substrate].